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# GEOLOGY 12 PROVINCIAL EXAMINATION

| | | Value | Suggested Time |
|---|---|---|---|
| 1. This examination consists of **two** parts: | | | |
| PART A: | 55 multiple-choice questions | 55 | 65 |
| PART B: | 13 written-response questions | 45 | 55 |
| | **Total:** | **100 marks** | **120 minutes** |

2. Electronic devices, including dictionaries and pagers, are **not** permitted in the examination room.

3. The **Data Booklet** contains information, graphs, and colour photographs you will need to answer certain questions on this examination.

4. The time allotted for this examination is **two hours.**

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## PART A: MULTIPLE CHOICE

**Value: 55 marks** **Suggested Time: 65 minutes**

**INSTRUCTIONS**: For each question, select the **best** answer and record your choice on the Response Form provided. Using an HB pencil, completely fill in the circle that has the letter corresponding to your answer.

REFERENCE DATA BOOKLET

**Refer to page vi of the Data Booklet.**

**Use Photographs 1 to 3 and the following table of hardness to answer questions 1 to 3.**

| OBJECT | MOHS SCALE OF HARDNESS |
|---|---|
| Glass or steel knife | 5.5 |
| Wire nail | 4.5 |
| Copper penny | 3.5 |
| Fingernail | 2.5 |

1. The mineral which is most common in Photograph 1 is economically important and can be scratched by a copper penny. The mineral is

   A. gold.
   B. pyrite.
   C. pyrrhotite.
   D. chalcopyrite.

2. The mineral shown in Photograph 2 can be scratched by a fingernail and is very common in metamorphic rocks. The mineral is

   A. quartz.
   B. calcite.
   C. gypsum.
   D. muscovite mica.

3. The specimens shown in Photograph 3 are all varieties of the same mineral. The mineral can scratch a knife blade or can itself be scratched by a knife blade. The mineral is also very common in rocks which have been, at some time, oxidized. The mineral is

   A. garnet.
   B. hematite.
   C. sphalerite.
   D. magnetite.

**OVER**

REFERENCE
DATA BOOKLET

**Refer to pages viii and ix of the Data Booklet.**
**Use the Rock Specimen Information Table to answer questions 4 to 8.**

4. The rock specimen which **most likely** recrystallized from a pre-existing rock during the application of heat and pressure is

   A. E
   B. F
   C. G
   D. H

5. The rock specimen which **most likely** cooled and crystallized from a magma is

   A. E
   B. F
   C. G
   D. H

6. The two specimens which would **most readily** be affected by chemical weathering are

   A. E and F
   B. F and G
   C. G and H
   D. E and G

7. The rock specimen which **likely** resulted from wind erosion, transportation and lithification is

   A. E
   B. F
   C. G
   D. H

8. The correct name for rock specimen **G** is

   A. basalt.
   B. marble.
   C. granite.
   D. gabbro.

9. According to Hutton's "Principle of Uniformitarianism," the earth's sedimentary rocks

   A. were all formed recently.
   B. are continuously being formed.
   C. ceased being formed billions of years ago.
   D. were deposited when the planet first formed.

10. Explosive volcanoes such as Mt St. Helens and Mt Fuji often erupt lava which is

   A. mafic and has a low viscosity.
   B. felsic and has a low viscosity.
   C. mafic and has a high viscosity.
   D. felsic and has a high viscosity.

| REFERENCE DATA BOOKLET | **Refer to page vi of the Data Booklet.**<br>**Use Photograph 4, of two Hawaiian lava flows, to answer questions 11 and 12.** |
|---|---|

11. The igneous rock type shown in the photograph is **most likely**

   A. basalt.
   B. gabbro.
   C. rhyolite.
   D. obsidian.

12. The flow type shown in the photograph that likely had the **lowest** viscosity before it solidified is called

   A. aa and appears in the foreground.
   B. aa and appears in the background.
   C. pahoehoe and appears in the foreground.
   D. pahoehoe and appears in the background.

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25. An unconformity exists at

A. W
B. X
C. Y
D. Z

26. The fossil in strata III of the column is **most typically** preserved by

A. replacement.
B. carbonization.
C. mold and cast.
D. permineralization.

27. The fossils in the column that were preserved from organisms that lived attached to the sea floor are shown in strata

A. I and II
B. I and IV
C. II and III
D. IV and V

28. The fossil in strata V was formed from a(n)

A. plant (ginkgo).
B. mollusc (clam).
C. coelenterate (coral).
D. arthropod (eurypterid).

**OVER**

REFERENCE
DATA BOOKLET

**Refer to page iii of the Data Booklet.**
**Use the Geological Map to answer question 2.**

2. a) Describe **one** change you would expect to see in the fossiliferous limestone due to contact metamorphism near the granite intrusion. **(1 mark)**

b) What changes in crystal size would be observed by a geologist as she walked the 200 metre section from **X** to **Y** across the granite? **(1 mark)**

**OVER**

9. There are areas in Canada where the land is rising. There are a number of reasons why this may occur. For example, the west coast of Vancouver Island is being uplifted due to plate tectonic processes and the Hudson's Bay region is being uplifted due to isostatic processes. Describe each of these processes.

   a) Plate tectonic uplift of the west coast of Vancouver Island. **(1 mark)**

   b) Isostatic uplift of the Hudson's Bay region. **(1 mark)**

13. Many scientists suggest that a large meteorite impact contributed to a mass extinction of plant and animal life on Earth 65 million years ago. Since that time, the earth's geological processes would have hidden most of the traces of such an impact, making it extremely difficult to find. Apart from the actual crater, describe **two** clues that might be found that would provide evidence of a large meteorite impact. **(2 marks)**

Clue 1: _____

_____

Clue 2: _____

_____

**END OF EXAMINATION**

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# GEOLOGY 12

## June 1998

Course Code = GEOL

| | |
|---|---|
| Score for Question 1: 1. _____ (8) | Score for Question 8: 8. _____ (4) |
| Score for Question 2: 2. _____ (2) | Score for Question 9: 9. _____ (2) |
| Score for Question 3: 3. _____ (3) | Score for Question 10: 10. _____ (4) |
| Score for Question 4: 4. _____ (5) | Score for Question 11: 11. _____ (3) |
| Score for Question 5: 5. _____ (2) | Score for Question 12: 12. _____ (4) |
| Score for Question 6: 6. _____ (2) | Score for Question 13: 13. _____ (2) |
| Score for Question 7: 7. _____ (4) | |